In the spring of 1997, the consultants completed an RSAT evaluation for all streams within the political boundaries of the City of Rockville that drain to Rock Creek. The purpose of the study was to evaluate stream conditions and provide a "snapshot" of their health and stability. The consultants conducted the RSAT Study following protocols as outlined in - *Final Technical Memorandum: Rapid Stream Assessment Technique (RSAT) Field Methods* by John Galli of the Metropolitan Washington Council of Governments. This section provides a summary of the RSAT method and the stream valley restoration sites. Photographs of the evaluated sites are included in Appendix A. The RSAT Analysis and Stream Prioritization Scoring for All Streams Within the City of Rockville Limits Within the Rock Creek Watershed report can be found in the Draft Subwatershed Prioritization Study (Appendix B).

3.1 RSAT FIELD WORK

The following eleven (11) streams were surveyed as part of this study:

- Lincoln Street
- Rockville High School
- Redgate
- Northeast Park
- Twinbrook
- Dover Road
- Southlawn
- Avery Road
- Calvin Park
- Maryvale
- Rock Crest

Transect sections were chosen in the field based on an approximate distance of 400 feet between transects in riffle locations large enough to collect adequate data.

Based on discussions with the City, the RSAT scoring system was modified from Galli's original scoring system. These changes placed more emphasis on the physical and riparian characteristics of the stream and less on the biological and instream habitat. This was done because the City, like most urban environments, has a greater capacity to improve the erosive and flooding forces that affect physical stream characteristics than it does to reintroduce sensitive biological species to the stream. The RSAT scores for the eleven stream segments are presented in Table 3-1.

In a conversation with Mr. Dan Harper of the Montgomery County Department of Environmental Protection on October 21, 1997, the consultants learned that the Southlawn stream segment is primarily within Montgomery County, and will therefore be addressed in the County's study of the Rock Creek Watershed.

TABLE 3-1
RSAT SCORES

RSAT Evaluation Category	Lincoln Street	Rockville High School	Redgate	Northeast Park	Twin-brook	Dover Road	South-lawn	Avery Road	Calvin Park	Maryvale	Rock Crest
1. Channel Stability	2	6.2	6.25	2.8	8	8.2	9	2	1	6	3.75
2. Channel Scour/Deposition	2	5	1	2.5	1	1	3	2	1	2.66	2.5
3. Physical Instream Habitat	3	4.4	2	2.2	2	1	4	2.25	3	3.8	2.75
4. Water Quality	3	2	4	3.75	0	1	3	3	2	2.5	1.75
5. Riparian Habitat Conditions	1.5	8	3	3	2	1.5	8	3	6	4	2.5
6. Biological Indicators	3	3	3	3	2	0	3	3	3	2	3
Total Score	14.5	28.6	19.25	17.25	15	12.7	30	15.25	16	20.96	16.25
Verbal Ranking	POOR	FAIR	FAIR	FAIR	POOR	POOR	GOOD	POOR	FAIR	FAIR	FAIR

*Table from "RSAT Analysis and Stream Prioritization Scoring for All streams Within the City of Rockville Limits Within the Rock Creek Watershed" dated October 1997

Poor (0-15), Fair (16-29), Good (30-41), Excellent (42-50)

The project prioritization method was employed for systematically prioritizing stream channel stabilization potential for the streams that were field-surveyed. Five general evaluation factors are employed by this method, as follows:

1. Overall site accessibility
2. Proximity of moderate/severe channel erosion areas to nearby residences or buildings
3. Environmental site sensitivity/expected tree removal
4. Level of existing or programmed upstream stormwater management (SWM) controls
5. Relative stream problem, taking stream size and baseflow into account

Prioritization of the stream segments followed general RSAT guidance. The results of the RSAT survey were presented to the City for prioritization, and the prioritization results are included in Appendix A.

3.2 GENERAL CONCLUSIONS

Water Quality, Biological Indicators, Physical Instream Habitat, and Channel Scour

All of the tributaries surveyed scored "poor" or "fair" in water quality, biological indicators, physical instream habitat, and channel scour, with the exception of Southlawn (which was considered without the piped section below the existing cul-de-sac) and Rockville High School. Southlawn scored "good" in instream habitat and Rockville High School scored "good" in instream habitat and channel scour. This is not surprising given the urban nature of the watershed. In order to achieve the greatest long-term benefits, the consultants recommend improving channel stability and riparian habitat before increasing macroinvertebrate diversity.

Riparian Habitat

Many of the streams lack sufficient riparian habitat or buffers and some existing buffers are of low quality. Only Rockville High, Southlawn and portions of Calvin Park and Redgate have extensive buffers which provide diverse terrestrial habitats and other benefits to the stream systems. The RSAT scores on many of the surveyed streams could be improved by enhancing the riparian buffers.

3.3 FINAL CONCEPTUAL DESIGNS

The City selected six stream valley restoration projects for conceptual design. A summary of the conceptual design projects is provided in Table 3-2. These sites are discussed in the following sections. Detailed information can be found in Appendix D, Stream Valley Restoration Conceptual Design Plans.

Table 3-2 City of Rockville Potential Stream Valley Restoration Sites

Project Area	Location (nearest street access)	Areas of Concern			Length of Improvements Proposed *(feet)*	Proposed Improvements Descriptions*	Additional Information
		Prioritization	Overall length Of stream Surveyed *(feet)*	Length of Severe Erosion *(feet)*			
Maryvale	First St. to Rockville Civic Center Mansion area	Low	3,450	745	535	▪ Toe protection with gabions or Class II stone ▪ Imbricated riprap ▪ Repair concrete flume	▪ 0.33 acres temp forest impact ▪ 0.22 acres of forestation added ▪ 0.13 acres passive buffer created
Redgate Golf Course	Red Gate golf course near E. Gude Dr. and Avery Rd. (2 separate sites)	High	1,600	0	620	▪ Grade the swale with drain tiles ▪ Lay the slope back ▪ Seed, stabilize and plant	▪ 0.05 acres temp forest impact ▪ SWM control also proposed at two facilities
Rockcrest	Atlantic Ave. to Broadwood Dr.	Moderate	3,700	215	260	▪ Install gabion baskets ▪ Install manhole ▪ Repair two outfalls to stream	Two stream segments will be repaired: ▪ Upper Rock Crest Tributary ▪ Spot erosion just upstream of Atlantic Ave
Rockville High School	Behind Rockville HS	Low with "hot spot" at apartment complex	4,300	590	770	▪ Wing deflectors with rock ▪ Cable trees on bank ▪ Stone check dams ▪ Install storm drain near apartment complex	▪ 0.94 acres temp forest impact
Calvin Park	Rockville Union Cemetery to main tributary	Low	2,100	875	945	▪ Use rock roll at toe ▪ Lay slope back and plant ▪ Rock pack under trees ▪ Install cross weir ▪ Create splay area	▪ 0.55 acres temp forest impact
Twinbrook Tributary	Alsace Lane	Project construction summer 1999	1,000	400	400	▪ Install gabion baskets	Severe erosion in side or rear yards is potential threat to several houses

Alternatives Considered:

Do Nothing ▪ Stormwater Management (SWM) Control only ▪ Stream Stabilization only ▪ SWM Control *and* Stream Stabilization

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* Not all improvements could be listed – these improvements are some of the bioengineering practices to be used.

3.3.1 ROCKVILLE HIGH SCHOOL

There are many locations along this tributary where the banks are eroding and would benefit from toe of slope stabilization. However, access to these areas is extremely difficult and would involve extensive tree removal. Since the tributary has an extensive existing buffer, stream valley restoration work is a low priority, with the exception of two "hotspots" described below:

- An existing sewer trunk line has been exposed in three places and repair/stream diversion work should be considered as a high priority.
- Of importance is a small tributary located between the Rockville High School and an apartment complex. This drainage swale has a severe headcut with a vertical drop of approximately 15 feet. This area should be repaired if possible, as it poses a potential safety threat. However, the land is privately owned. The City should work with Montgomery County Public Schools to address this when Rockville High School next expands or upgrades its site.

3.3.2 REDGATE

The Redgate tributary begins at the outflow of the Redgate Golf Course ponds. It flows through a portion of the golf course and under Route 28 to join Croyden Creek and the Rockville High School tributary. The stream channel to the south of Route 28 has a forested riparian buffer and is more stable than the portion flowing through the golf course. The RSAT scores combine the two conditions and result in a score of "Fair". The portion within Redgate Golf Course needs a small woody riparian buffer to improve its condition. Recognizing the potential concerns of the golf course, the buffer could be composed of a narrow row of short shrubs with a 15-foot "no mow" buffer surrounding the shrubs.

3.3.3 TWINBROOK

Twinbrook is heavily armored with gabion baskets, many of which are within 100 feet or less of existing homes. There are no restoration alternatives for this stream, but one hotspot should be addressed. Several homes are within 25 feet of the stream at the end of Alsace Lane. The existing armoring should be extended at these locations. Rockville Department of Public Works performed stream stabilization along streambanks through Twinbrook Park in 1999 in conjunction with the Recreation Center construction. Scour protection at the pedestrian bridge and culvert at Twinbrook Parkway was also provided.

3.3.4 CALVIN PARK

The Calvin Park tributary has extensive stream stabilization needs. Due to the lack of quantity controls, this stream has a greater number of failing or failed trees than any other stream in the study area. The worst bank erosion occurs just below the culvert where the stream daylights in the park. Some type of stormwater management facility for the park, either above or below Baltimore Road, should be revisited in the next watershed study.

3.3.5 MARYVALE

Given the scoring for this heavily impacted stream, additional buffers and possible bioengineering techniques could be applied to increase its value, particularly in the upper section near Route 28. The various partial biological migration barriers existing along the stream channel should be removed or modified.

3.3.6 ROCKCREST

Rockcrest Park is a narrow strip of parkland with a stream that has been stabilized in places. The stream is mowed almost up to its banks and would benefit from afforestation. An asphalt trail adjacent to the stream is threatened in places by continued erosion.

Between transects 1 and 2 there is a failing concrete apron that was likely used for a utility crossing. Gabion walls on both banks are failing. Stream flow is undermining the right gabion bank. Flow should be diverted to the center of stream. The existing flow notch should be filled and the failing gabion removed. The bank should be reinforced with riprap and surge stone placed in the existing scour pool. To relieve pedestrian foot traffic on side slopes, a footbridge could be installed for access from park to tennis courts. The 3 to 4-foot gradient drop that has developed below the concrete apron should be stabilized.